IN THE UNITED STATES PATENT & TRADEMARK OFFICE

SUBJECT:

Serial #:	10/647,762
File Date:	August 25, 2003
Inventor:	Cherng-Chyi Han, et al.
Examiner:	Paul D. Kim
Art Unit:	3729
Title:	Short Yoke Stitched Writer with Low DC Coil Resistance

DECLARATION UNDER 37 CFR 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Cherng-Chyi Han, Mao-Min Chen and PoKang Wang, hereby state:

1. I am a co-inventor of Claims 1-8 of the above-identified instant application.

2. Prior to August 1, 2003, we conceived of the idea for a Short Yoke Stitched Writer with Low DC Coil Resistance, as described and claimed in our application. The invention disclosure including drawings shows our invention as claimed in Claims 1-8 and particularly described and shown on a cover page, and pages 1-7, of the invention disclosure. The invention disclosure is attached as Exhibit A. Each of the dates blanked out from Exhibit A is prior to August 1, 2003.

3. George O. Saile & Associates forwarded to us a draft copy of the patent application along with a letter dated June 24, 2003 (Exhibit B). This letter shows due diligence from prior to the effective date of the reference (August 1, 2003) to the subsequent filing of the patent application as detailed hereinafter.

4. We returned the signed patent application to George O. Saile & Associates on or about August 8, 2003. Exhibit C is a copy of an extract of the mail log of George O. Saile & Associates showing receipt of the signed returned patent application HT02-029 on August 8, 2003. This exhibit shows due diligence from prior to the effective date of the reference (August 1, 2003) to the subsequent filing of the patent application as detailed hereinafter

5. The instant Patent Application 10/647,762 was constructively reduced to practice (by filing of a US Patent Application) on August 25, 2003.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Cherng-Chyi Han Date 11/9/05

Mao-Min Chen Date 11/9/05

PoKang Wang Date 11/9/05

Enclosure: Exhibits A-C

EXHIBIT A

29

HT02-0XX

Title: A Method To Make Short Yoke Length Stitched Writer With Low DC Coil Resistance

Inventors: C.C. Han, Mao-Min Chen, PoKang Wang

What is the invention?

For high data rate writer application, one of the requirements is to have fast saturation and low inductance to induce short rise time. On the other hand, the low fly height for high areal density recording head beyond 60GB is needed in order to have better head performance. However, many reliability problems associated with this low fly height appearing. Problem such as thermal pole tip protrusion that induces by thermal mismatch of alumina and pole material during writing process will create head disk interface problem and eventually damage the read head. One of the solutions to reduce thermal pole tip protrusion is to reduce DC coil resistance of writer so that less heat is generated during writing process. Also, the lower DC coil resistance benefits the coil thermal reliability.

In this proposal, we propose to have coil feed through design so that the coil DCR is further reduced in comparison with current LP stitched writer.

Claims:

1. Lower coil DCR is achieved with same coil turns and yoke length in comparison with current LP stitched writer
2. A novel writer structure with lower coil DCR
3. Narrow coil pitch structure can be obtained by this proposal
4. With HB resist and Cu CMP process, the inter coil spacing can be further reduced since there is no constrain by dielectric filling

Problems solved:

1. Lower coil DCR to reduce thermal pole tip protrusion.
2. Improve coil thermal reliability
3. Simplified wafer level process

Advantages:

1. To improve thermal pole tip protrusion problem to enhance drive reliability and yield
2. To improve drive yield through better coil thermal reliability

Prior arts:

Sasaki's patent on planar writer(US patent 6317288)

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CONFIDENTIAL

HT02-029

INVENTION PROPOSAL

Submitter (Type/Print Legal Name)	Date	Submitter (Type/Print Legal Name)	Date
1. Cherng-Chyi Han		2. Mao-Min Chen	
Submitter (Type/Print Legal Name)	Date	Submitter (Type/Print Legal Name)	Date
3. Pokang Wang		4.	

Descriptive title of proposal:
A Method To Make Short Yoke Length Stitched Writer With Low DC Coil Resistance

Has invention been built, made, run or tested? Yes__X___ No_____ Summary of the result:

Names of others known to have worked on this same technology inside of Headway, and other companies: None

Date of any previous or planned disclosure external to Headway and type of disclosure (demonstration, paper given, presentation, published article, etc.). Please provide a copy of a paper or article, if applicable.

Was or will this disclosure be pursuant to a Confidential Nondisclosure Agreement? Yes_____ No___X__

Was any outside funding involved? Yes_____ No___X___ If so, describe:

Identify any known related invention proposals, patents, publications or commercial work and attach copies, if practical.

Submitter (Sign Legal Name)	Date	Submitter (Sign Legal Name)	Date
1. Cherng-Chyi Han		2.	
Submitter (Sign Legal Name)	Date	Submitter (Sign Legal Name)	Date
3.		4.	
Witnessed and Understood By (Type/Print and Sign)	Date	Witnessed and Understood By (Type/Print and Sign)	Date
Jin-Fei Li / Yun-Fei Li		Hui-Chuan Wang / Hui-Chuan Wang	

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CONFIDENTIAL

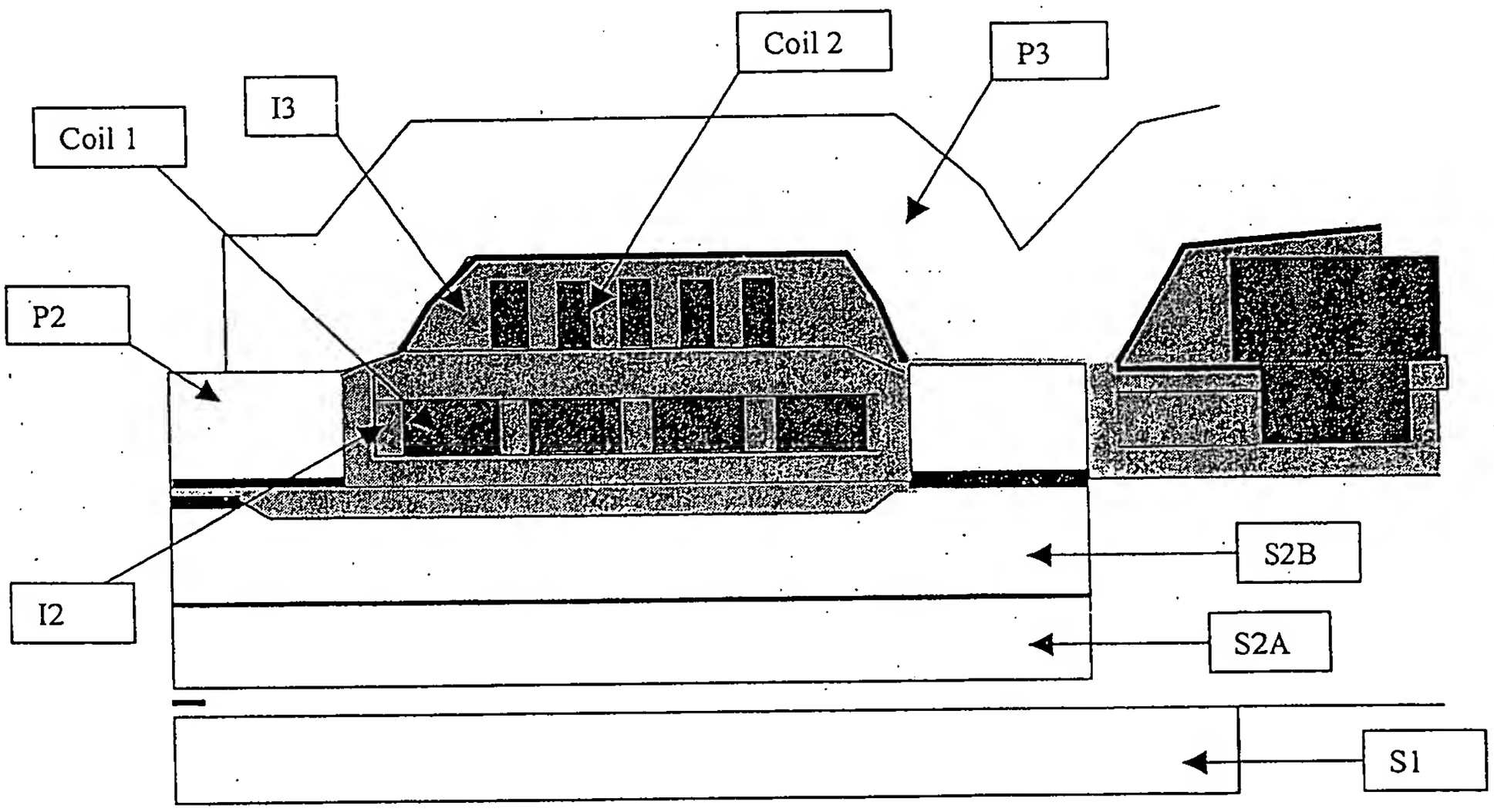
INVENTION PROPOSAL

Descriptive title of proposal:
A Method To Make Short Yoke Length Stitched Writer With Low DC Coil Resistance

Description of idea:
For high data rate writer application, one of the requirements is to have fast saturation and low inductance to induce short rise time. On the other hand, the low fly height for high areal density recording head beyond 60GB is needed in order to have better head performance. However, many reliability problems associated with this low fly height appearing. Problem such as thermal pole tip protrusion that induces by thermal mismatch of alumina and pole material during writing process will create head disk interface problem and eventually damage the read head.
One of the solutions to reduce thermal pole tip protrusion is to reduce DC coil resistance of writer so that less heat is generated during writing process. Also, the lower DC coil resistance benefits the coil thermal reliability.

In this invention proposal, we propose the novel two layers coil structure with low DC coil resistance for short yoke length stitched writer.

Figure 1 is the current Headway's two layers coil stitched writer design.



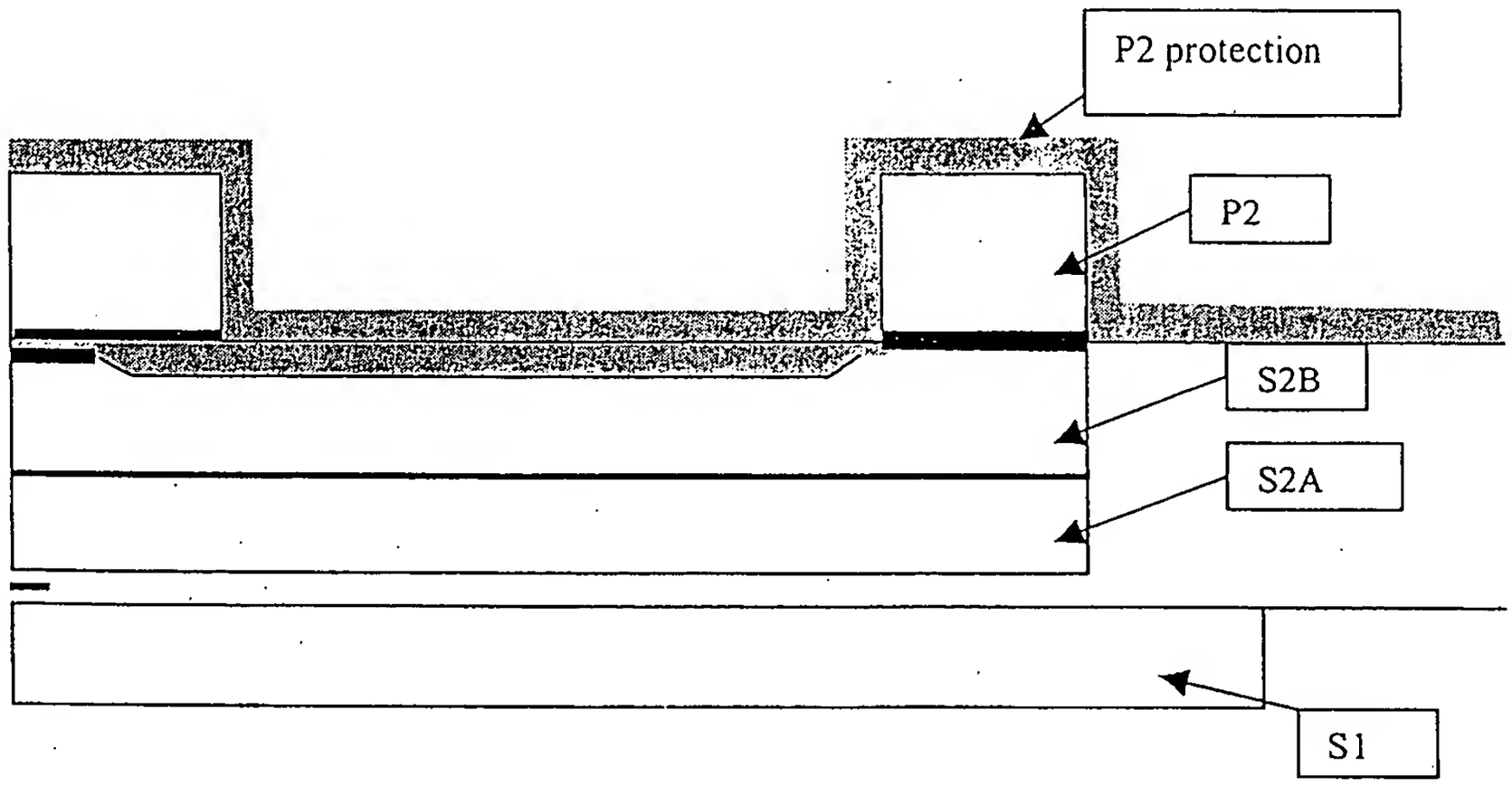
The major drawback of this 2 layers coil stitched writer structure is high DC coil resistance since the main coil resistance contribution is from coil2.

Submitter (Sign Legal Name) 1. Hau	Date	Submitter (Sign Legal Name) 2.	Date
Submitter (Sign Legal Name) 3.	Date	Submitter (Sign Legal Name) 4.	Date
Witnessed and Understood By (Type/Print and Sign) Yun-fei Li / Yun-fei Li	Date	Witnessed and Understood By (Type/Print and Sign) Hui-Chuan Wang / Hui-Chuan Wang	Date

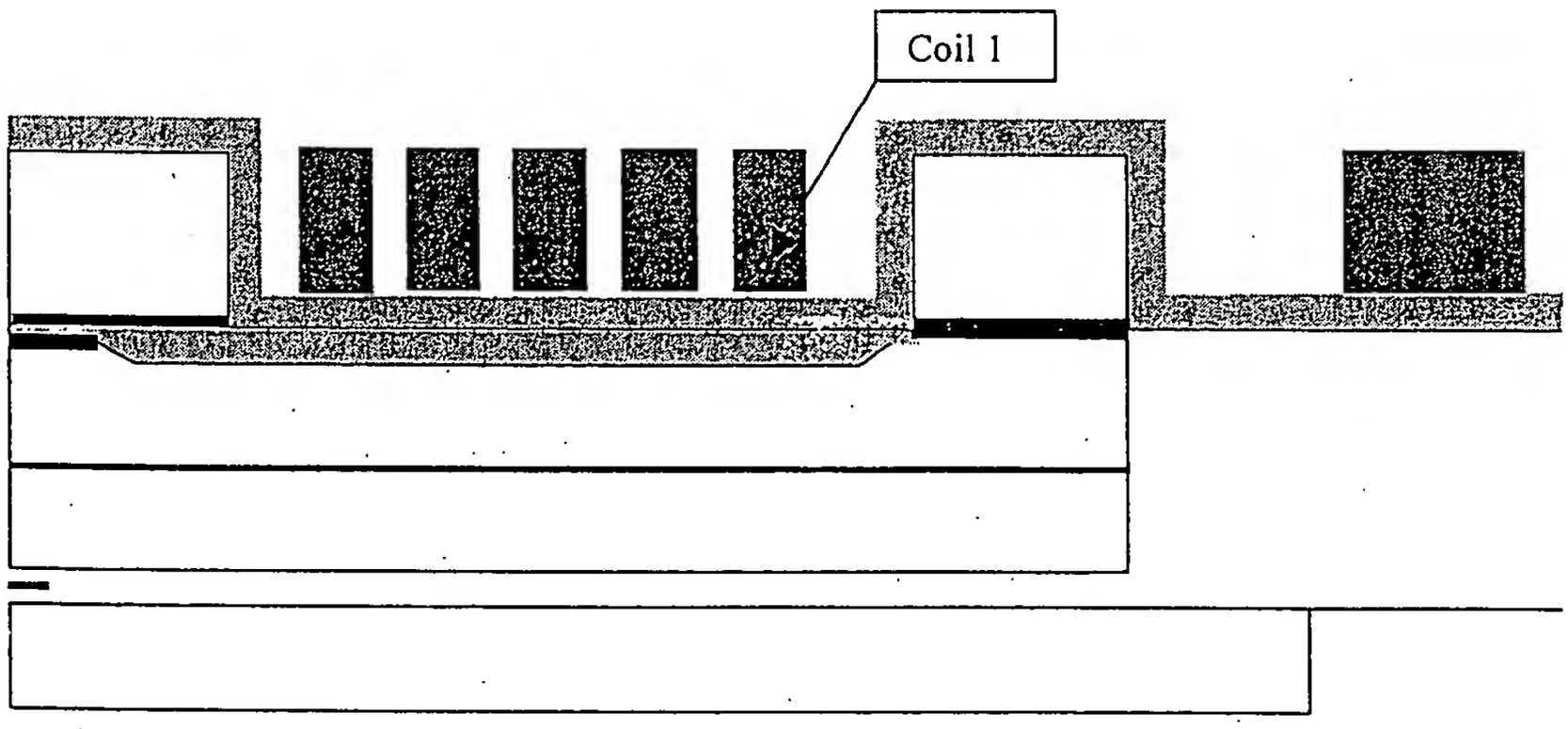
NOTE: Each attached page of additional description must be signed, dated and witnessed.

The proposed two layers coil planar writer structure is the following

1. P2 Protection layer after P2 PPT process



2. Coil patterning and seed layer removal



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Submitter (Sign Legal Name)	Date	Submitter (Sign Legal Name)	Date
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Witnessed and Understood By (Type/Print and Sign)	Date	Witnessed and Understood By (Type/Print and Sign)	Date

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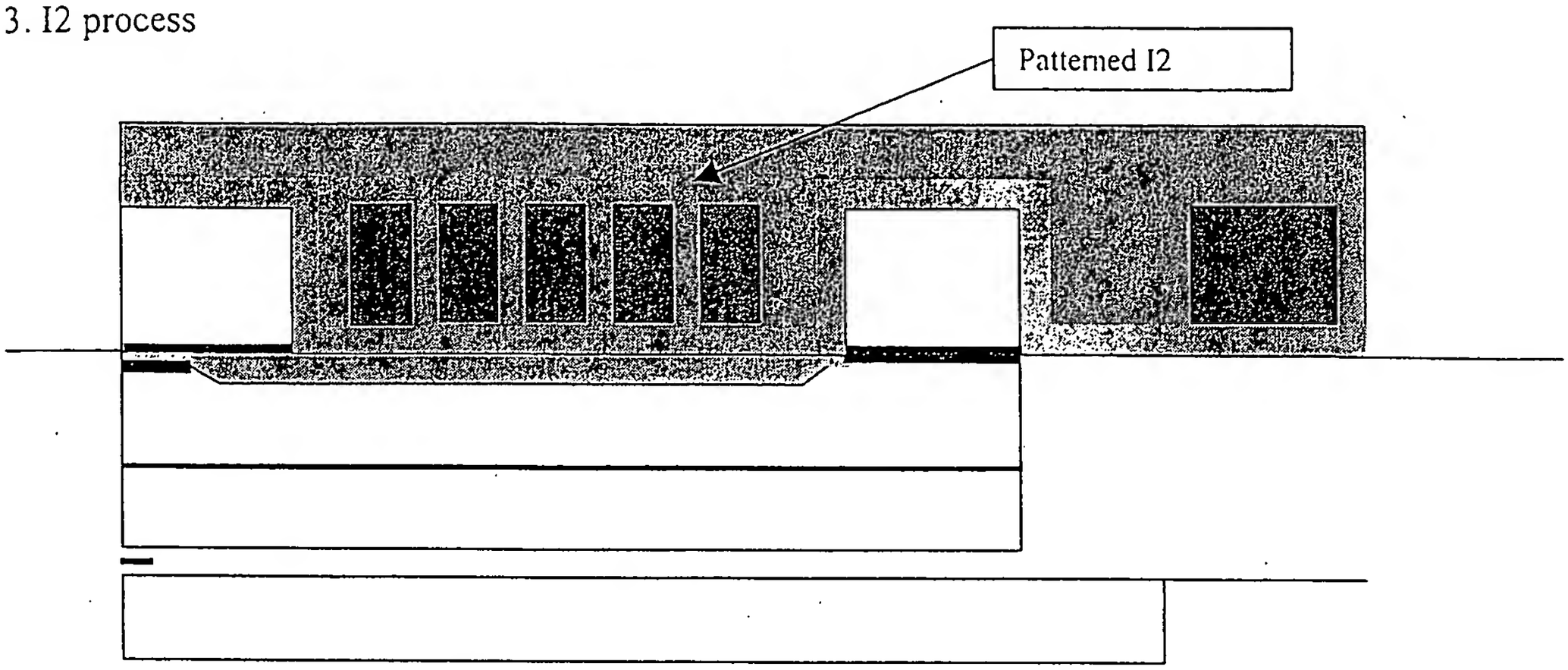
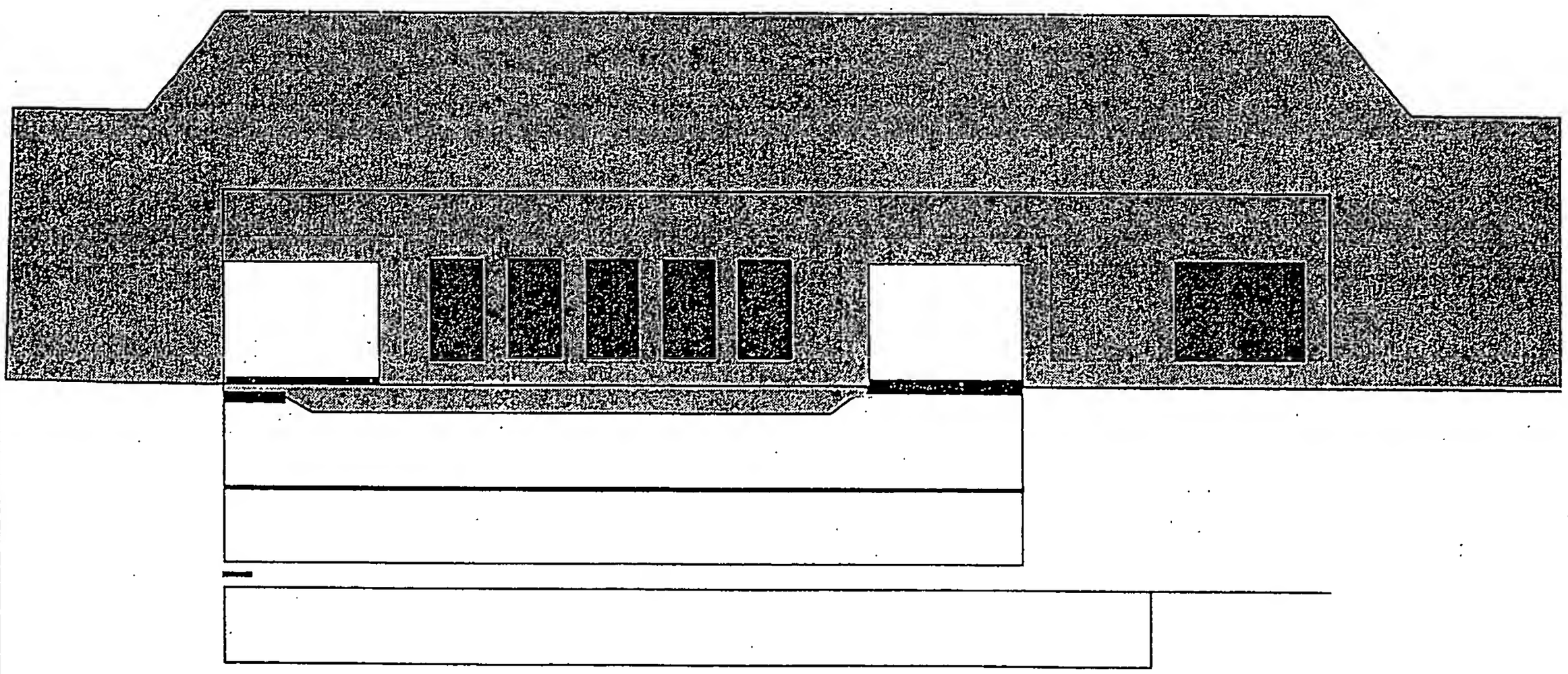
3. I2 process



4. P2 DP process



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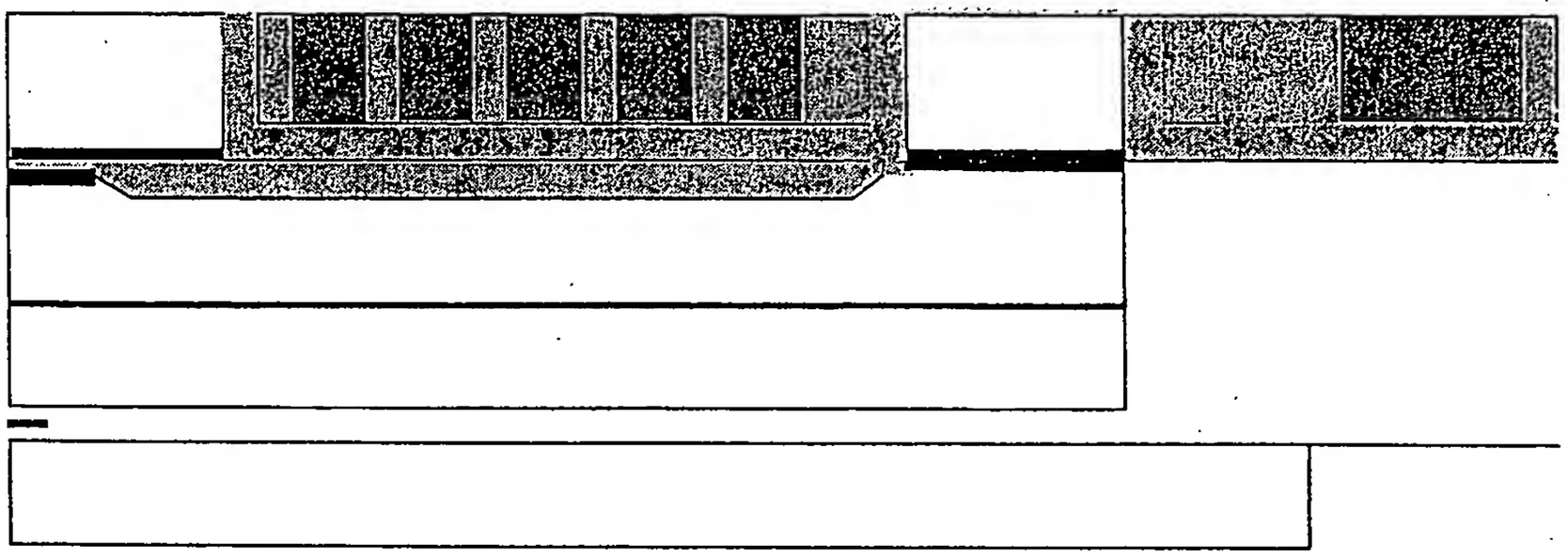
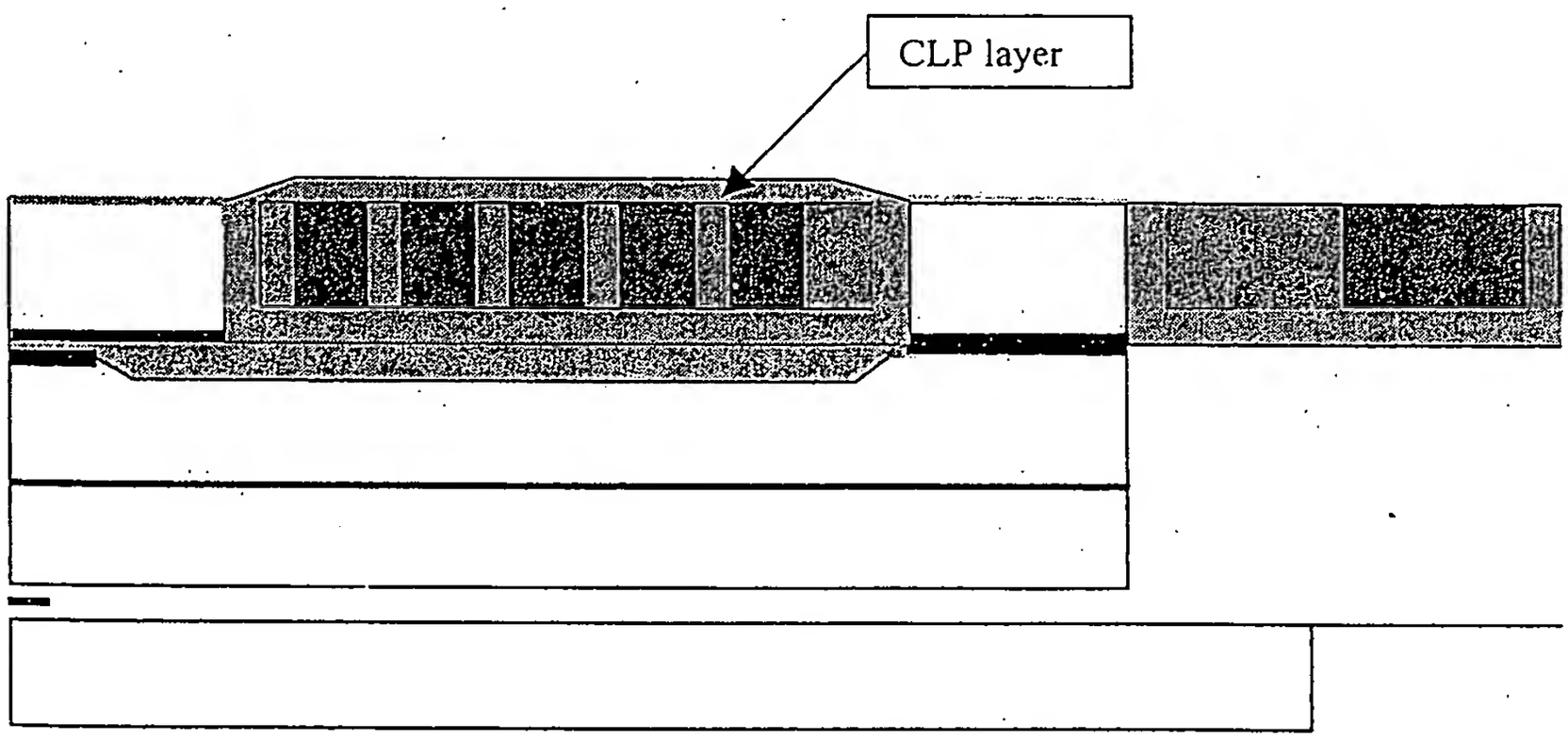
Witnessed and Understood By (Type/Print and Sign) Yun-fei Li / Yun-fei Li	Date	Witnessed and Understood By (Type/Print and Sign) Hsi-Chuan Wang / Hsi-Chuan Wang	Date

NOTE: Each attached page of additional description must be signed, dated and witnessed.

5. P2 CMP



6. CLP and ZRP deposition and patterning Process(first and second coil isolation layer)



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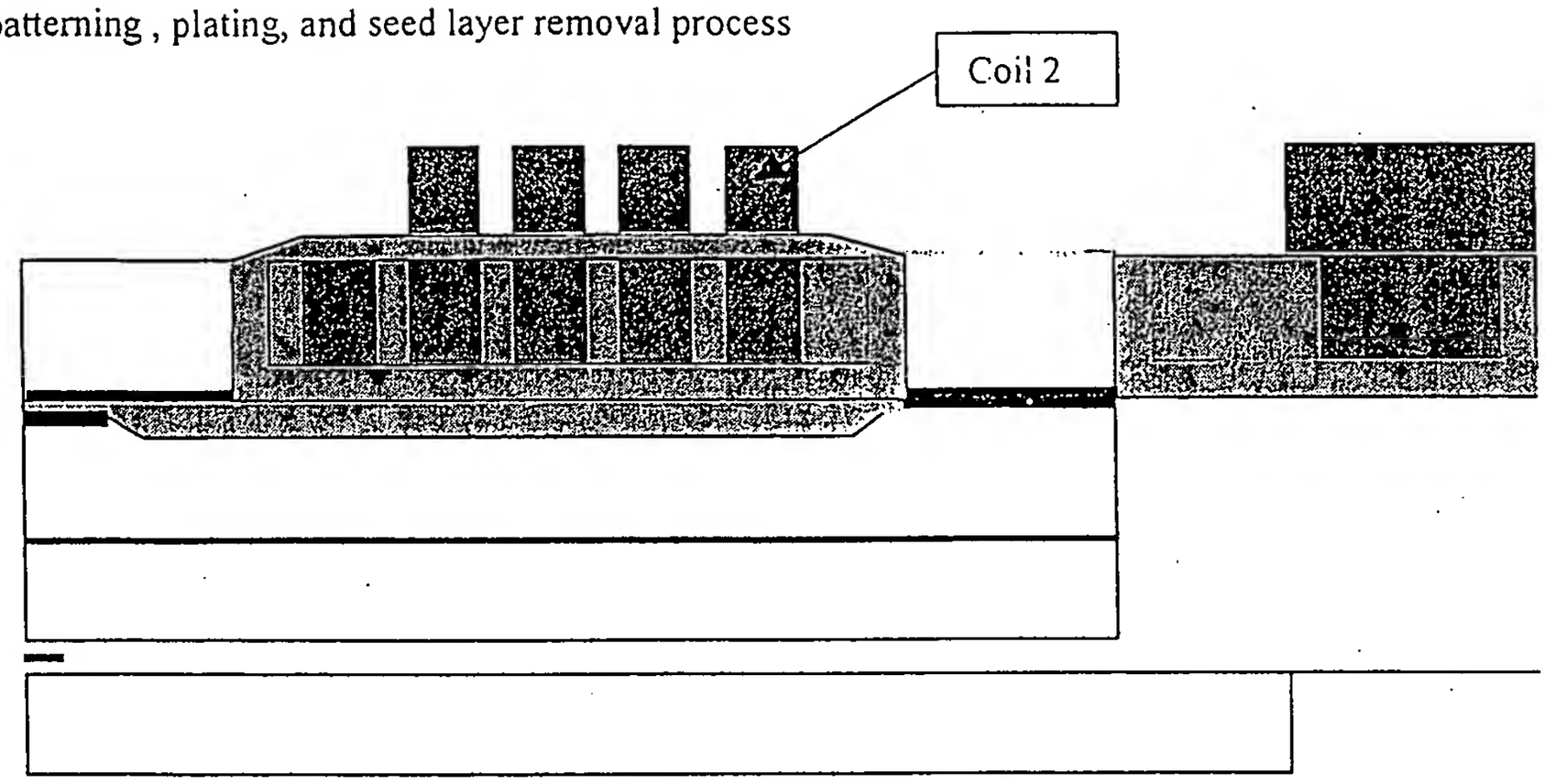
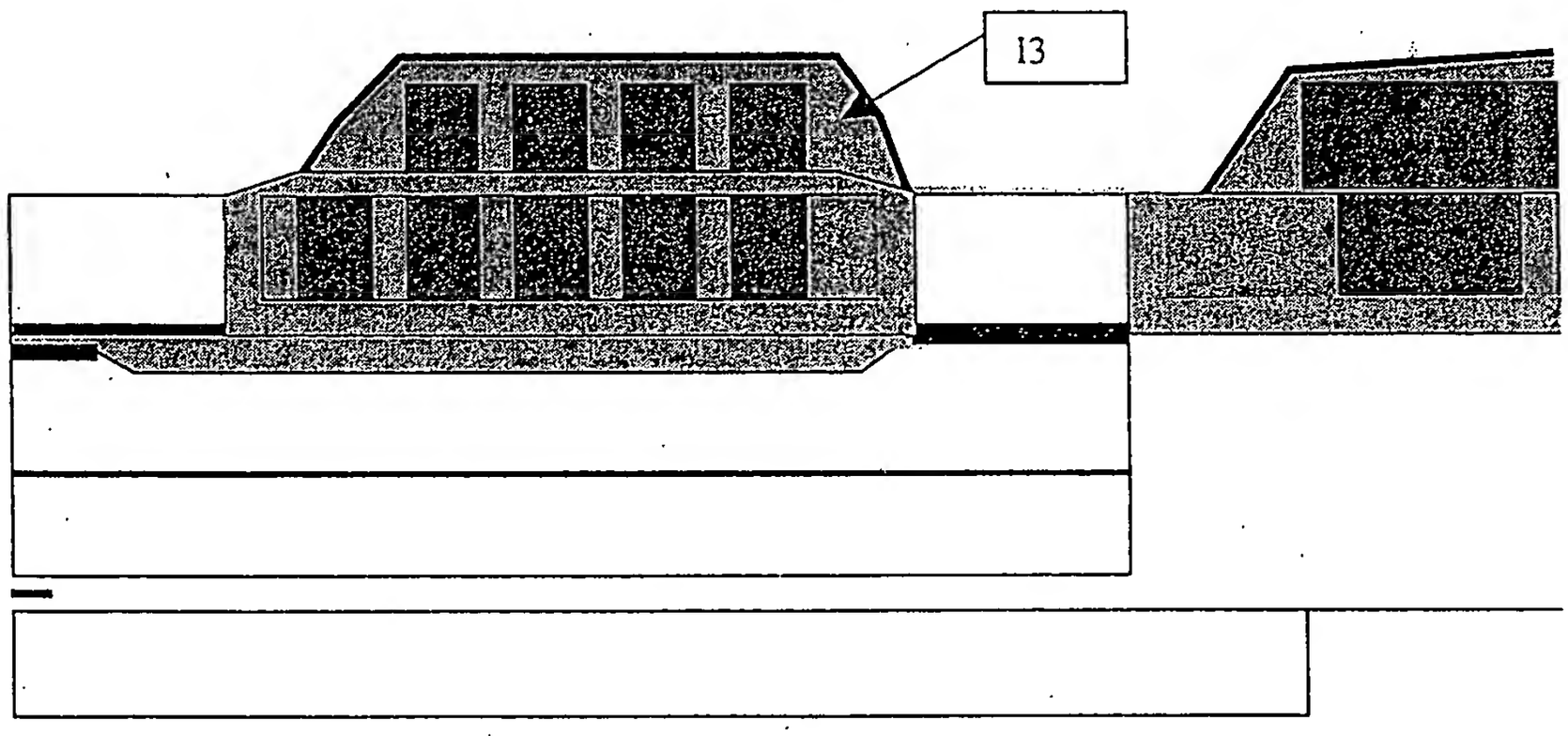
Submitter (Sign Legal Name) 3.	Date	Submitter (Sign Legal Name) 4.	Date
Witnessed and Understood By (Type/Print and Sign) Yun-fei Li / Yun-fei Li	Date	Witnessed and Understood By (Type/Print and Sign) Hui-Chuan Wang / Hui-Chuan Wang	Date

NOTE: Each attached page of additional description must be signed, dated and witnessed.

7. Coil 2 patterning , plating, and seed layer removal process



9. I3 Process



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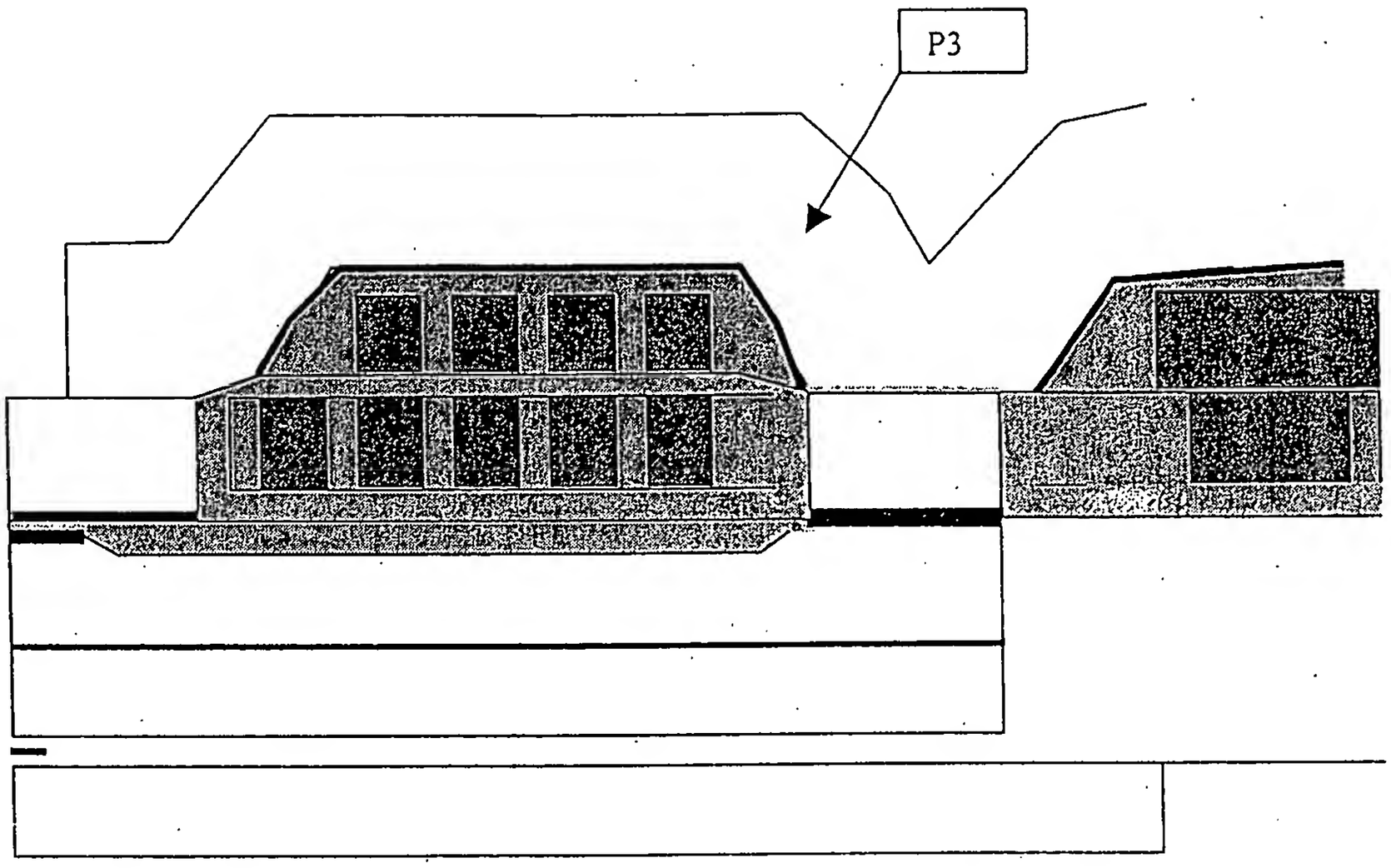
Submitter (Sign Legal Name) 3	Date	Submitter (Sign Legal Name) 4.	Date
Witnessed and Understood By (Type/Print and Sign) Yun-fei Li / Yun-fei Li	Date	Witnessed and Understood By (Type/Print and Sign) Hui-Chuan Wang / Hui-Chuan Wang	Date

NOTE: Each attached page of additional description must be signed, dated and witnessed.

10. P3 Patterning Process



With this configuration, one can reduce coil DCR by 2ohm and maintain the same yoke length and number of coil turns. Also, the overall process is simplified and better yield due to wider coil pitch process.

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Submitter (Sign Legal Name) 3.	Date	Submitter (Sign Legal Name) 4.	Date
Witnessed and Understood By (Type/Print and Sign) Yun-fei Li / Yun-fei Li	Date	Witnessed and Understood By (Type/Print and Sign) Hui-Chuan Wang / Hui-Chuan Wang	Date

NOTE: Each attached page of additional description must be signed, dated and witnessed.

GEORGE O. SAILE & ASSOCIATES
28 DAVIS AVENUE
POUGHKEEPSIE, NY 12603

EXHIBIT B

June 24, 2003

TO: Ms. Vicky Smith
Headway Technologies, Inc.

FROM: Stephen B. Ackerman
Fax: 845 4712064

Subject: Patent Application Reference **HT02-029**
Inventors: **Cherng-Chyi Han, Mao-Min Chen, Pokang Wang**
* Please have the inventors fill in all blanks.

The subject Patent Application is now ready for the Inventor's signature on the (1) Declaration and Power of Attorney, and (2) Assignment of Invention forms. **Please have the Inventors sign their complete name and in order of first name, then family name.** These forms are enclosed with a copy of the drawings, specification and claims of the Patent Application. The drawings are informal at this time, but will be made formal for filing with the Patent Office and a copy of them will be sent to you.

Do not make any changes in the Patent Application. But do note any typographical, etc. errors, and let me know what they are on a separate sheet of paper.

Please fill in the required information on these forms and have the Inventors sign them. Also make copies of these papers for your own files as needed. Please send the original Patent Applications and the signed Forms to me by EXPRESS MAIL DELIVERY. It is important to file patent applications as quickly as possible.

With Best Regards,

Stephen B. Ackerman

EXHIBIT C

Dockets Returned

ıte Rcvd	Docket No.	Atty/Agent	Status	Changes?		Memo
				Spec	Dwgs	
8/8/03	HT02-029		SR			